FDI and Economic Growth: A Changing Relationship Across Country and Overtime

Hayat, Arshad and Cahlik, Tomas

Institute of Economic Studies, FSV Charles University Prague, University of Economics Prague, Metropolitan University Prague

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Tomas Cahlik
IES, FSV, Charles University Prague, VSE Prague
Email: Cahlik@fsv.cuni.cz
Arshad Hayat
IES, FSV, Charles University Prague, MUP Prague
Email: 85684626@fsv.cuni.cz

Abstract:

In this paper, we use a threshold regression model to estimate a threshold level of natural resource abundance and split the sample of 70 countries into groups of low-natural resource and high-natural resource groups. We found evidence that FDI has a positive impact on economic growth of the host country if the host country's natural resource sector is below the threshold. However, FDI inflow doesn't have any significant impact on growth in countries with natural resource sector larger than the threshold. In the end, we apply a Markov regime switching model (MSM) to a time series data from Pakistan and found that Pakistan's economy experienced 2 states. While in the state 1 the economy didn't experience any FDI induced economic growth, it did receive a strong FDI induced economic growth in state 2.

Key Words: FDI, Economic Growth, Natural Resources, Threshold Model, Markov Switching Model
JEL Classification: P45, O47, P28

1. Introduction:

Foreign direct investment (FDI) and its impact on the host country economic growth has been investigated extensively. While many studies suggest a positive impact of FDI on economic growth (see for example (Javorcik & Spatareanu, 2008) (Reganati, Pittiglio, & Sica, 2008)), the idea of FDI-induced economic growth is still debated and an overwhelming majority view the FDI growth relationship to be ambiguous (Bruno & Campos, 2003; Gorg & Greenaway, 2003). This has led researchers to come up with modelling contingency effects in FDI-growth relationship. Studies have suggested that the FDI growth relationship is dependent on many other factors. For instance, level of economic development (Blomstrom, Lipsey, & Zejan, 1994), financial markets development (Alfaro, Chanda, Kalemli-Ozcan, & Sayek, 2004; Hermes & Lensink, 2003) (Azman-Saini, Law, & Ahmad, 2010), trade liberalization (Balasubramanyam, Salisu, & Sapsford, 1996), human capital (Borensztein, Gregoreio, & Lee, 1998), economic stability and liberal markets (Bengoa & Sanchez-Robles, 2003), technology gap between the host and origin country (Havranek & Irsova, 2011).

This paper is focusing on the country specific heterogeneous factors that influence the FDI-economic growth relationship. The missing link in the literature in this regard is the impact of natural resource abundance on the FDI-economic growth relationship. This paper explores the role of the size of the natural resource sector in altering the FDI-growth relationship. Natural resource abundance is an important factor in attracting foreign direct investments (Kekic, 2005). However, natural resource abundant countries are expected to growth slower than the resource scarce countries (Sachs & Warner, 2001). Therefore, FDI inflow into the natural resource sector is expected to enlarge the resource sector and potentially slower the growth rate of the country. Studies have also shown that resource rich countries tend to divert FDI inflow into resource sectors (Asiedu & Donald, 2011). This is expected to lower the FDI in the non-

resource tradable sectors. This diversion of the FDI from non-resource tradable sector to natural resource sector is the reason behind the lack of positive spill-overs and technology transfers taking place (Asiedu, 2006). Therefore, we expect the larger size of the natural resource sector to divert FDI into the natural resource sector at the cost of non-resource sector and this will lead to any potential FDI induced growth to vanish.

However, the role of natural resources in the FDI-growth relationship has hardly been investigated. One exception is (Hayat, 2014), who investigated the role of natural resource abundance on the FDI-growth relationship by using a linear interaction model and concluded that natural resource rich countries tend to receive no FDI-induced growth while countries with lower levels of FDI receive positive FDI-induced growth. The limitation with such linear interaction model (a product of natural resource and FDI) again is that it assumes the growth effect of FDI to be monotonously decreasing (increasing) with the increase (decrease) in the size of natural resource sector in the country. However, it maybe that FDI inflow into an economy with a natural resource sector beyond a certain size tends to be ineffective in inducing economic growth. Therefore, there is a need for a different kind of model with a more flexible specification to explain the FDI, natural resource and economic growth relationship. This paper uses a different approach to investigate the same question of FDI-growth relationship altering role of natural resource sector. This paper uses threshold (sample splitting) model to find the threshold size of the natural resource sector which would give a clear difference in the FDI-growth relationship.

Secondly, we use data from Pakistan and investigate the changing nature of FDI-growth relationship overtime. The nature of FDI and the levels of FDI attracted by countries has been changing over time and the structure of the economies attracting the FDI is also changing.

Countries now promote FDI inflow not only to balance the balance of payments but also to enhance production capacity and competitiveness. The other major factor is the enormous sophistication in the production technologies and information technology overtime. This technological improvement while positively affect economic growth on its own is also expected to attract more FDI and enhance the FDI induced economic growth. The focus of countries governments had been on the promotion of FDI inflow. However, more recently the focus has been on the attraction of FDI and on the kind of FDI the country is attracting and its impact on the domestic economy. Countries have been focusing on creating policies e.g. liberal labour markets, liberal trade regimes and competitive markets to attract FDI and enhance FDI induced economic growth (Te Velde, 2006). Therefore, it is interesting to investigate if the FDI-growth relationship has been changing overtime or the relationship is constant overtime. The focus of this paper is on FDI inflow Pakistan is attracting and its impact on Pakistan's economic growth overtime.

Figure 1. *FDI inflow, Economic Growth in Pakistan (1980-2015)*

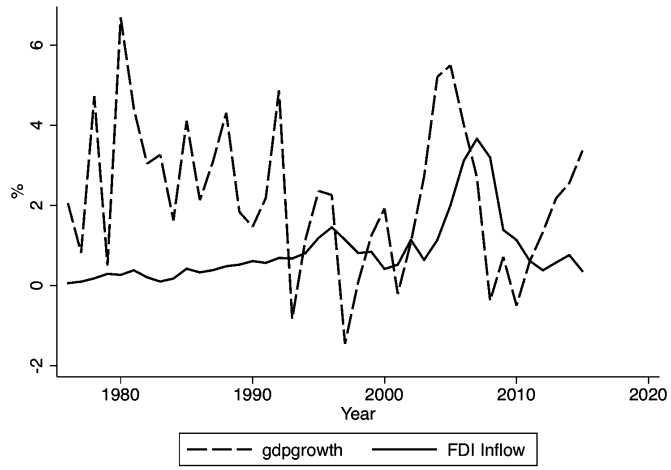


Figure 1 above shows the FDI inflows into Pakistan and the economic growth the country has experienced over the period. Pakistan has experienced terrorism and different political upheavals in the last few decades that have influenced both the FDI inflow and economic growth in the country over the period. There are periods of high FDI inflows and low FDI

inflows and in the same way high and low economic growth periods, which is an indication of the presence of different states of FDI inflow into Pakistan, different states of economic growth and possibly different states of the FDI-growth relationship in Pakistan.

There are hardly any studies conducted on the time-varying nature of the FDI-growth relationship. The only exception in this case is (Yang, 2007) who found that the FDI-growth relationship is time-varying in nature. However, the paper used a linear regression which is based on the prior assumption that the relationship between the FDI inflow and economic growth is monotonously increasing or decreasing overtime. However, it is quite possible that the relationship between the FDI inflow and economic growth is less(more) stronger in one period while more(less) stronger in another period. In this case, the model bases on the assumption of monotonously increasing (decreasing) would give misleading results. Therefore, in this paper, we suggest the Markov switching dynamic regression model (MSM) with regime switching overtime. This model will allow us to analyse the FDI-growth relationship over different regimes and test for the significance of the regimes.

The contribution of this paper is twofold. Firstly, we investigate if the FDI-economic growth relationship is changing across countries with heterogeneous levels of natural resource. We estimate a natural resources threshold and investigate if the FDI-growth relationship remains the same for countries with larger than threshold natural resource sector compared to that of countries with smaller than threshold natural resource sector. The threshold model will enable us to relax the assumption of a monotonic FDI-growth relationship and investigate the changing nature of FDI-economic growth relationship across countries with different levels of natural resources. Secondly, we investigate the time-varying nature of FDI-growth relationship using a time series data from Pakistan. We investigate the presence of different regimes overtime by

applying Markov Regime switching dynamic regression model (MSM) to a time series data for Pakistan and investigate a time-varying FDI-economic growth relationship across the regimes. We also estimate the transitional probabilities of the FDI-growth relationship moving from state 1 to state 2 and vice versa. This again enables us to relax the assumption the FDI-growth relationship remains the same overtime. The only study conducted on time-varying nature of the FDI-growth relationship used a linear model.

This paper concludes that the FDI-economic growth relationship varies across countries with heterogeneous levels of natural resource abundance. Countries with the natural resources below the threshold tend to experience FDI induced growth. However, countries above the threshold level of natural resources do not experience any FDI-induced economic growth. For Pakistan, we found the presence of two states and found that FDI has no significant effect on economic growth in state 1 while in state 2 an increase in FDI inflow leads to a significant increase in economic growth. The estimated transitional probabilities indicate the FDI-growth relationship when in state 1 has 91.5% probability of remaining in state 1 and a 65.5% probability of switching to state 1 while in state 2.

The rest of the paper is organized as follows: section II describes the methodology and data used in the paper. Section III presents the results and section IV concludes the paper.

2. Methodology and Data

In this section, we describe the methodology used in the paper investigate the FDI-growth relationship across countries with heterogeneous level of natural resources and Markov regime Switching Model (MSM) to investigate the presence of more than one states in FDI-growth relationship overtime for Pakistan.

2.1 Threshold Mode:

This section describes the methods used in this paper. In order to estimate the regime switching threshold regression, consider the following single threshold model:

$$Y_{it} = \alpha + X_{it}\beta + FDI_{it}(NR \geq \gamma)\eta_1 + FDI_{it}(NR < \gamma)\eta_2 + u_i + e_{it} \quad (1)$$

The equation (1) can also be written as the following

$$Y_{it} = \beta X_{it} + \begin{cases} \eta_1 FDI_{it} + e_{it} & NR \leq \gamma \\ \eta_2 FDI_{it} + e_{it} & NR > \gamma \end{cases}$$

where Y_{it} is the per capita GDP growth rate and X_{it} are the control variables including initial GDP, which is GDP per capita for the year 1996, inflation rate, population growth rate, domestic investment, institutional and governance quality, trade volume and schooling. The variables are discussed in detail in the data section below. FDI_{it} is the net foreign direct investment inflow into the country. NR is the ratio of natural resource exports to the total goods exports and it is the threshold variable that acts as a sample-splitting variable. The threshold variable NR divides the equation into two regimes with coefficients $\eta_1 and\, \eta_2$. This specification enables us to quantify the impact of FDI inflow on economic growth in two different subsets depending on if the size of natural resource sector is greater or smaller than the threshold level of γ.

The coefficients β, η_1 and η_2 are estimated using fixed effects estimation method. The threshold variable $\hat{\gamma}$ is estimated as described by (Hansen, 2000). The estimation method for panel data threshold regression is described by (Wang, 2015). The threshold parameter γ is tested for significance by conducting F- test, testing the following null hypothesis $Ho = \eta_1 = \eta_2$.

2.2 Markov Switching Model:

In this part of the paper we use Markov switching dynamic regression model to investigate the presence of different states overtime in Pakistan's economic growth and the variations in the FDI-growth relationship across those states.

$$Y_t = \mu_s + X_t\gamma + FDI_t\beta_s + \varepsilon_{s,t} \quad (2)$$

where

Y_t is the GDP growth rate per capita, μ_s is the state-dependent intercept and X_t is the vector of control variables with state invariant coefficients. The variables include, population growth rate, inflation rate, institutional quality, trade volume, domestic Investment, government spending and schooling.

Further, we estimate the following transitional probabilities. The probability of the current state, J, depends on the previous state.

$$P(S_t = j \mid S_{t-1} = i, \ldots) = P(S_t = j \mid S_{t-1} = i) = P_{ij}$$

P_{ij} is the probability of being in state j in the current period given that in the previous period the process was in the period i. In the end, we test for the significance of the parameters across states.

2.3 Data:

This section describes the data used in the paper. The summary statistics of the data used are presented in the table.1 below. This paper uses annual real GDP growth rate per capita, ratio of net FDI inflow to GDP and the variable used for natural resource is the ratio of natural resource export to the total goods export. The same indicator is used by most of the studies investigating the role of natural resources. Other control variables used in this paper are gross domestic investment as the ratio of gross domestic capital formation to GDP, the population growth rate, trade volume as the ratio of exports plus imports to GDP, inflation rate.

Table.1 Comparative Statistics

Variable	Mean	Std. Deviation	Minimum	Maximum
Real GDP Growth/Capita	2.493	3.736	-14.420	22.998
FDI/GDP	0.037	0.045	-0.160	0.507
NR Exports/Total Goods Exports	0.230	0.252	0.000	0.988
Initial GDP/Capita	10603.26	15104.13	149.36	88002.61
Population Growth	1.380	1.144	-3.820	8.723
Inflation	0.075	0.302	-0.036	10.583
Investment/GDP	0.234	0.066	0.002	0.544
Schooling	2.745	1.453	0.08	6.821
Institutional Quality	55.056	25.394	4.718	99.676
Trade Volume/GDP	0.786	0.484	0.156	4.396

Schooling and Initial GDP was found to have multicolinearity. Therefore, this paper used a first difference of schooling variable. Source: *World Bank databank*

Institutional quality variable is the average value of six institutional quality indicators including "Rule of law", "Regulatory quality", "Government efficiency", "Political stability and absence of violence", "Voice and accountability" and "Control of corruption". These indicators are produced by the World Bank project called the Worldwide Governance Indicators (WGI)[1]

Schooling is used as an indicator of human capital which is the average years of secondary schooling. The paper is based on a yearly data sample of 70 countries for the period 1996- 2015. Country selection is solely based on the availability of data. Data on all the variables is obtained from the World Bank database that can be accessed online[2].

[1] http://info.worldbank.org/governance/wgi/index.aspx#home
[2] http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators

3. Analysis of Results:

This section analyses the results. Table.2 presents based on estimation of equation (1) using natural resources (NR) as the threshold variable. The threshold is estimated to be 0.204 which is significant at 5% confidence interval with p-value 0.03 which is calculated using the bootstrap method with 10,000 replications and a trimming of 10%.

Table2: *FDI inflow and Growth: Threshold Regression using the size of Natural Resource Sector as a threshold variable*

Variable		***Coefficients***	***Standard Errors***
Initial GDP		-0.443**	0.198
Population Growth		-4.246***	0.681
Inflation		-3.498***	0.940
Institution Quality		0.216	0.143
Investment		3.252***	0.438
Schooling		2.325*	1.260
Trade Volume		1.607***	0.529
FDI			
Low NR	$NR \leq \gamma$	12.518***	3.097
High NR	$NR > \gamma$	-2.270	3.654
Threshold Estimate ($\hat{\gamma}$)		0.204**	
F Test for no Threshold		12.65	
Bootstrap p-value		0.036	
No of Countries		70	
No of Observations		1400	
R-Squared		0.126	

Notes: *The dependent variable is real GDP growth (1996–2015). Initial GDP is the log of per capita GDP at the during the year 1996. p-value for the threshold test was bootstrapped with 10,000 replications and 10% trimming percentage. There are 478 and 922 observations in the high-NR and low-NR, respectively.* Source: *Authors estimations*

Therefore, as the threshold estimate is significant we can divide the sample into two subsets. Countries with the natural resource export of more than 20.44% can be classified as the high-

NR group (i.e. natural resource abundant countries) and countries with the natural resource export less than the threshold can be classified into the low-NR group (i.e. natural resource scare countries). As can be seen in table 2 the FDI impact on economic growth for the low-NR group is ($\eta_1 = 12.518$ with s.e.=3.094) while the impact of FDI on economic growth in the high-NR countries is ($\eta_2 = -2.290$ with s.e.=3.650). The coefficient of FDI for the low-NR is $\eta_1 = 12.518$, which is significant at 1% confidence interval which means that a one percent increase in the FDI inflow into resource scarce countries increases economic growth by a 0.125 percentage points. While the coefficient of FDI for the high-NR is $\eta_2 = -2.290$ which is negative, however, insignificant. This suggests that FDI inflow into resource rich countries doesn't induce any economic growth. However, in resource scarce countries FDI inflow has a strong and significant impact on economic growth. This is very much in line with the expectation that larger size of natural resource sector in a country alters the FDI inflow in favour of the natural resource sector at the cost of non-resources tradable sector and studies have shown that the size of natural resource sector is associated with the slower growth rates. Therefore, further FDI inflows into the already large resource sector will expand the resource sector but the impact on the overall economy is insignificant. While the FDI inflow into non-resource tradable sector is strongly positive and significant. The rest of the results are very much in line with the expectation. Initial GDP, population growth rate and inflation rate all have a significant negative impact on the growth rate of real GDP per capita. Investment, schooling and trade volume all have a strong positive and significant impact on the growth rate of real GDP per capita. Institutional quality, though has positive however insignificant impact on economic growth.

Results based on equation 2 are presented below in table:3, whereby we investigate the relationship between FDI inflow and economic growth in Pakistan and the presence of more than one regime.

Table3: *FDI inflow and Economic Growth in Pakistan: Markov Switching Model Estimation*

Variable	***Coefficients***	***Robust Standard Errors***
Population Growth	-11.434*	5.926
Inflation	0.137***	0.023
Institution Quality	12.754**	5.809
Government Spending	0.456***	0.167
Investment	0.331	0.264
Schooling	8.711***	1.733
Trade Volume	-0.419***	0.126
FDI		
State 1	0.884	0.593
State 2	8.944***	0.925
No of Observations	19	

Notes: *The dependent variable is real GDP growth (1996–2015). Population growth rate, Institutional quality, schooling, investment, trade volume and FDI inflow variables were found to have unit to be non-stationary and were integrated of degree one. Therefore, first differences of these variables were used.* Source: *Authors estimations*

As shown in the table 3 above, FDI inflow in state 1 has no significant impact on economic growth in the country. However, in state 2 the impact of FDI inflow is strong and significant. Specifically, in the state 2 a 1% increase in FDI inflow resulted in a 0.08 percentage points increase in the real GDP growth rate per capita in Pakistan. This indicates a strong presence of the regime effect and proves that there is significant variation in the FDI-growth relationship overtime across different states. Schooling, institutional quality and government spending all have a positive and significant impact on economic growth in Pakistan while population growth rate and trade volume were found to have negative impact on economic growth during the period.

The transitional probabilities of moving from state 1 to state 2 and vice versa are estimated and presented in table 4 below. P11=0.915 which indicates the probability of staying in state 1 while being in state 1 is 91.5%. P12=0.084 indicating a mere 8.5% probability of moving to state 2

while being in state 1. In the same way, P21, the probability of moving to state 1 while being in state 2 is 65.5% and P22, the probability of staying in state 2 while being in state 2 is 34.5%.

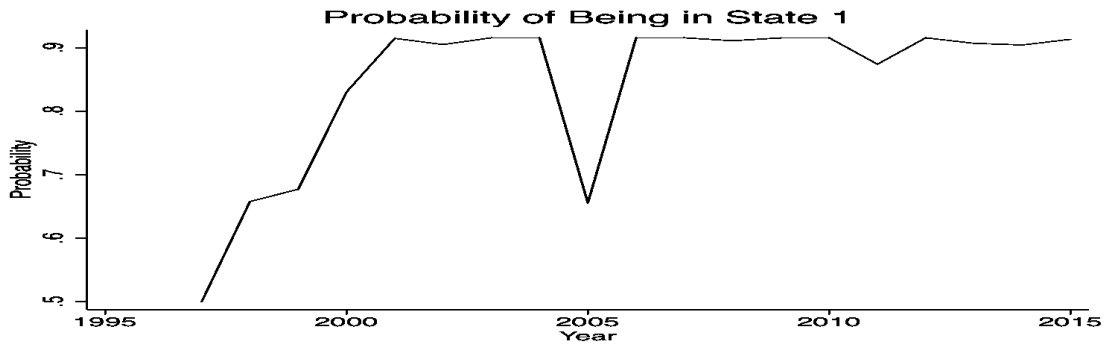
Table: 4 Transitional Probabilities

Probabilities	**Estimate**
P11	0.915
P12	0.085
P21	0.655
P22	0.345

Source: *Authors estimations*

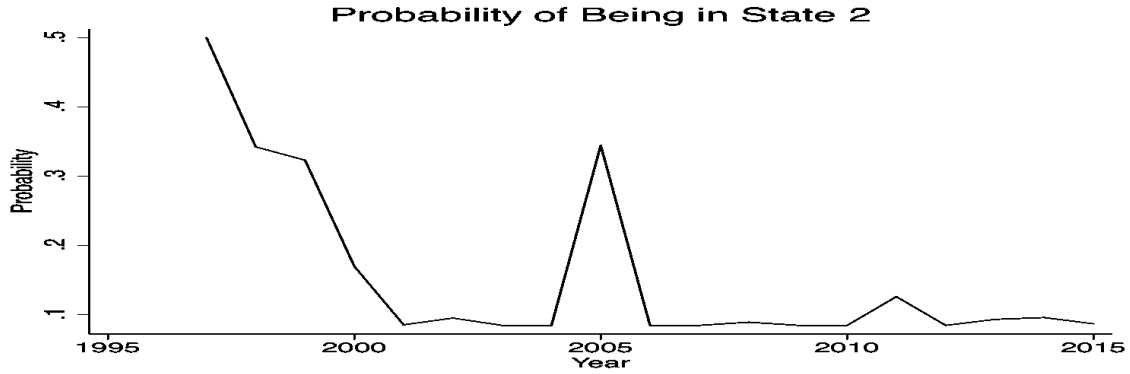
The transitional probabilities indicate a strong tendency of the FDI-growth relationship in Pakistan to remain in the state 1 where FDI doesn't have any significant impact on economic growth of the country. Figure 2 and figure 3 below present the probabilities of the FDI-growth relationship in Pakistan to remain in the state 1 and state 2 in the given years. Figure 2 shows that the probability of being in state 1 is above 90% from the year 2000 to the year 2015 except for the year 2005. Figure 3 shows that the probability of being in state 2 is less than 10% during the years 2000 to 2015 except for 2005. However, the probability of being in state 2 is greater than 30% during the year 2005 and the years before 2000.

Figure:2 Probability of being in State 1 (1996-2015)



Source: *Authors estimations*

Figure:3 Probability of being in State 2 (1996-2015)



Source: *Authors estimations*

4. Conclusion:

In this paper, we investigate the relationship between FDI and economic growth across countries and overtime. Many studies have investigated the FDI economic growth relationship. In this paper, we attempted to close the gap in the literature with respect to FDI economic growth relationship across countries with heterogeneous levels of natural recourse sectors. We applied a threshold model to estimate a threshold level of the natural resource sector and found that countries with the natural resource sector smaller than the threshold, tend to experience higher FDI induced economic growth while countries. However, countries with the natural resource sector larger than the threshold, tend to experience no significant FDI induced economic growth. This is expected as studies have shown that countries with larger natural resource sector tend to receive FDI in the natural resource sector at the cost of FDI in the non-resource sector. This diversion of FDI into the resource sector is expected to crowd out the potential growth effect of FDI inflow. Our study confirms that countries with the natural resource exports larger than 20% of the totals exports tend to experience no significant FDI induced growth.

In the second part of the paper, we applied the Markov switching model (MSM) to investigate the presence of different regimes in the impact of FDI on economic growth in Pakistan and

found the presence of two regimes in the FDI and economic growth relationship. We found that the probability of being in state 1 is more than 90% for the period 2000 to 2015 except for 2005. During this regime (state 1), FDI inflow has no significant impact on economic growth. However, during the year 2005 and the years before 2000, we found the probability of being in state 2 to be larger than 30%. During this regime (state 2) Pakistan experienced strong FDI induced economic growth. We also found that Pakistan's economy has a more than 90% probability of staying in state 1 while being in state 1 and another 65.5% probability of moving back to state 1 while being in state 2.

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Appendix:

[The following Unit root testing and correlation coefficients were estimated for the time series data for Pakistan used in the MSM model estimation]

Testing for Unit Root

1. GDP Growth per capita, level

Dickey-Fuller test for unit root — Number of obs = 39

Interpolated Dickey-Fuller

	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-4.619	-3.655	-2.961	-2.613

MacKinnon approximate p-value for Z(t) = 0.0001

2. FDI Inflow, (level)

Dickey-Fuller test for unit root — Number of obs = 39

Interpolated Dickey-Fuller

	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-1.832	-3.655	-2.961	-2.613

MacKinnon approximate p-value for Z(t) = 0.3646

3. FDI inflow, lag(1)

Dickey-Fuller test for unit root — Number of obs = 38

Interpolated Dickey-Fuller

	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-2.724	-3.662	-2.964	-2.614

MacKinnon approximate p-value for Z(t) = 0.0699

4. Inflation, level

Dickey-Fuller test for unit root — Number of obs = 39

Interpolated Dickey-Fuller

	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-2.870	-3.655	-2.961	-2.613

MacKinnon approximate p-value for Z(t) = 0.0490

5. Trade Volume, level

Dickey-Fuller test for unit root — Number of obs = 39

Interpolated Dickey-Fuller

	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-2.626	-3.655	-2.961	-2.613

MacKinnon approximate p-value for Z(t) = 0.0877

6. Trade Volume, lag(1)

Dickey-Fuller test for unit root — Number of obs = 38

Interpolated Dickey-Fuller

	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-2.541	-2.438	-1.690	-1.306

p-value for Z(t) = 0.0078

7. Investment, level

Dickey-Fuller test for unit root — Number of obs = 39

Interpolated Dickey-Fuller

	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-1.796	-3.655	-2.961	-2.613

MacKinnon approximate p-value for Z(t) = 0.3822

8. Investment, lag(1)

Dickey-Fuller test for unit root — Number of obs = 38

Interpolated Dickey-Fuller

	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-1.575	-2.438	-1.690	-1.306

P-value for Z(t) = 0.0621

9. Population Growth, level

Dickey-Fuller test for unit root — Number of obs = 39

Interpolated Dickey-Fuller

	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	0.044	-3.655	-2.961	-2.613

MacKinnon approximate p-value for Z(t) = 0.9620

10. Population Growth, lag(1)

Dickey-Fuller test for unit root — Number of obs = 38

Interpolated Dickey-Fuller

	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-2.700	-2.438	-1.690	-1.306

P-value for Z(t) = 0.0053

11. Institutions, level

Dickey-Fuller test for unit root — Number of obs = 19

Interpolated Dickey-Fuller

	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-1.524	-3.750	-3.000	-2.630

MacKinnon approximate p-value for Z(t) = 0.5217

12. Schooling, level

Dickey-Fuller test for unit root — Number of obs = 39

Interpolated Dickey-Fuller

	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-0.161	-3.655	-2.961	-2.613

MacKinnon approximate p-value for Z(t) = 0.9430

13. Schooling, lag(1)

Dickey-Fuller test for unit root — Number of obs = 38

Interpolated Dickey-Fuller

	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-6.641	-3.662	-2.964	-2.614

MacKinnon approximate p-value for Z(t) = 0.0000

14. Government Spending, level

Dickey-Fuller test for unit root — Number of obs = 39

Interpolated Dickey-Fuller

	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-1.402	-3.655	-2.961	-2.613

MacKinnon approximate p-value for Z(t) = 0.5815

15. Government Spending, lag(1)

Dickey-Fuller test for unit root — Number of obs = 38

Interpolated Dickey-Fuller

	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-4.995	-3.662	-2.964	-2.614

MacKinnon approximate p-value for Z(t) = 0.0000

Correlation Coefficient

Variable	FDI	Inflation	Trade	Investment	G	Schooling	Population	Institutions
FDI	1							
Inflation	-0.3217	1						
Trade	0.3323	0.2148	1					
Investment	0.3286	-0.1954	0.2710	1				
G	0.2082	0.0971	0.2004	0.0306	1			
Schooling	0.2493	-0.454	0.3345	0.6647	-0.2598	1		
Population	-0.0556	0.7287	0.1640	-0.0699	0.4235	-0.291	1	
Institutions	0.2012	-0.1767	0.3633	-0.0037	0.4563	-0.0905	0.1445	1

List of Countries Used in the Threshold Model:

Albania Algeria Argentina Australia Bahrain Belize Bolivia Botswana Brazil Bulgaria Cameroon Canada Chile China Colombia Costa Rica Cote d'Ivoire Croatia Czech Republic Denmark Ecuador Egypt, Arab Rep. El Salvador Ghana Guatemala Honduras Hungary Iceland India Indonesia Israel Japan Jordan Kazakhstan Kenya Korea, Rep. Malawi Malaysia Mexico Morocco Mozambique New Zealand Nicaragua Pakistan Panama Paraguay Peru Philippines Poland Romania Russian Federation Saudi Arabia Senegal Singapore South Africa Sri Lanka Sweden Switzerland Tanzania Thailand Togo Tunisia Turkey Uganda Ukraine United Kingdom United States Uruguay Venezuela, RB Vietnam